

NEW SPECIES OF NEARCTIC *ORTHOTRICHIA* (HYDROPTILIDAE, TRICHOPTERA)

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A critical examination of recent collections of Hydroptilidae from the eastern half of the United States has disclosed the presence of three new species in the genus *Orthotrichia*. These are described and a brief synopsis of the six Nearctic species of the genus is given in this paper. Types and a series of paratypes of the new species are deposited in the collection of the Illinois Natural History Survey; another series of paratypes has been returned to Dr. Blickle, University of New Hampshire.

Species of *Orthotrichia* are found in North America, Europe, India and Africa. A certain amount of asymmetry is present in the male genitalia in all known species of this genus, but this is most pronounced in the Old World species. In the six presently-known Nearctic species, the claspers and the subgenital plate are symmetrical but the aedeagus and the tenth tergite show asymmetry. The males bear a clavate, mesal process on the seventh sternite (Fig. 4*F*) and a short acuminate tooth on the posterior margin of the sixth. In three of the six species (*baldufi*, *dentata* and *instabilis*), the tenth tergite bears a sickle-shaped spine on its left margin (Fig. 3*A*, *lp*) and a sclerotized angulate thickening of the membrane of its right margin. The aedeagus (Fig. 1*H*) varies somewhat even within each species and does not bear any apparent taxo-

nomic characters. Its position in relation to other parts of the genital capsule is indicated in Figs. 2*A* and 2*B*. Associated females are known for only three species (*americanus*, *cristatus* and *baldufi*) but these show good specific differences. The larvae bear no known characters for specific determination.

The lack of ocelli, the acuminate wings and the lack of a terminal spur on each of the front tibia of *Orthotrichia* indicate that it may be most closely related to *Hydroptila* but in the latter the subgenital plate is not as well differentiated as in *Orthotrichia* and the larval cases of the two genera are different.

Characters of the genus *Orthotrichia*.—Length 2-4mm. Wings pointed at apex, venation as figured by Betten (1934, Plate 12, Fig. 6). Ocelli absent. Spurs 0-3-4. Mesoscutellum subtriangular. Metascutellum subrectangular (Ross 1944, p. 119, Fig. 445). Male genitalia with claspers small, fused to sternite at base; subgenital plate Y- or T-shaped, articulated with base of claspers, anterior stem free in body cavity; aedeagus very long and slender, usually as long as the abdomen, anterior half tubular, posterior half rod-like, and having a spirally twisted sclerotized filament attached to its middle (Fig. 1*H*); tenth tergite membranous, sometimes with sclerotized areas and spines. Female genitalia simple, tubular.

KEY TO NEARCTIC SPECIES OF
Orthotrichia—MALES

1. Subgenital plate with long, slender lateral arms each bearing a long, stout hair (Fig. 2A); large internal process *ip* present. *americana*
Subgenital plate with lateral arms short and rounded (Fig. 4E, 6E); no internal process *ip* present2
2. Shaft of subgenital plate without ventral tooth-like processes (Fig. 1A); slender rod-like process arising from right margin of tenth segment (Fig. 1A, *rp*)*cristata*
Shaft of subgenital plate with ventral tooth-like processes (Fig. 4E); no process *rp* present3
3. Apex of tenth tergite rounded, simple and entirely membranous (Fig. 6A); without a long, sclerotized process *lp* arising from its left margin*curta*
Apex of tenth tergite rounded or cleft, but having a dark, sclerotized area along right margin and with a long, sclerotized process *lp* arising from its left margin. (Fig. 4A)4
4. Posterior margin of clasper (in ventro-caudal view) with mesal lobe as long as outer lobe (Fig. 5D)*dentata*
Clasper with mesal lobe not as long as outer lobe (Figs. 4A, 3D)5
5. Shaft of subgenital plate with very small processes; apex of plate angularly cleft (Fig. 3A)*instabilis*

Shaft processes variable in size; apex of subgenital plate never cleft (Figs. 4A, 4E) .*baldufi*

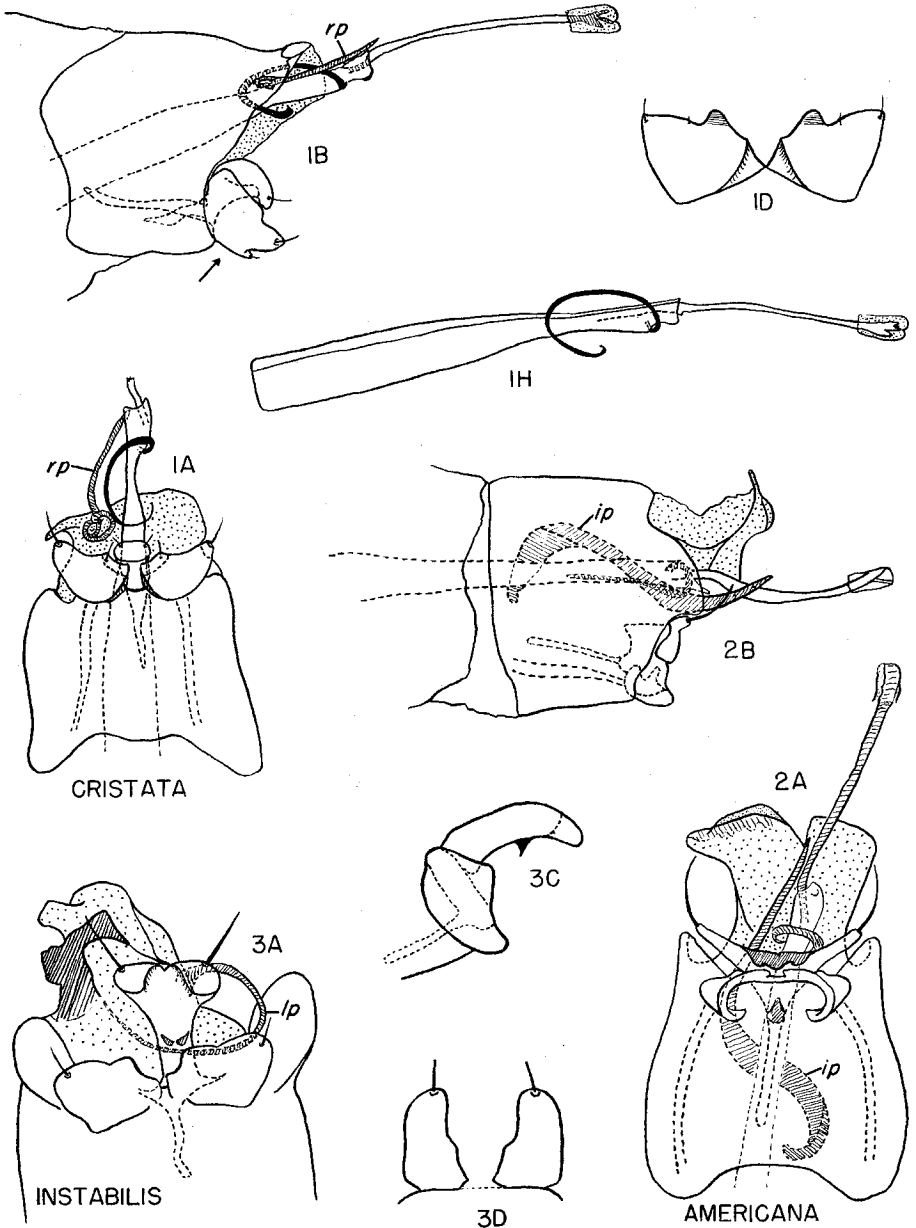
Orthotrichia americana BANKS

This is the only known Nearctic species with a spirally twisted, sclerotized process surrounding, but not attached to, the median tubular portion of the aedeagus (Figs 2A, 2B, *ip*). Another peculiarity of the species is the greatly elongated lateral arms of the subgenital plate. This condition is approached only by *curta* which also has reduced claspers similar to *americana*. The dark, sclerotized median area of the subgenital plate may correspond to the tooth-like ventral process in *baldufi*, *curta*, *dentata*, and *instabilis*.

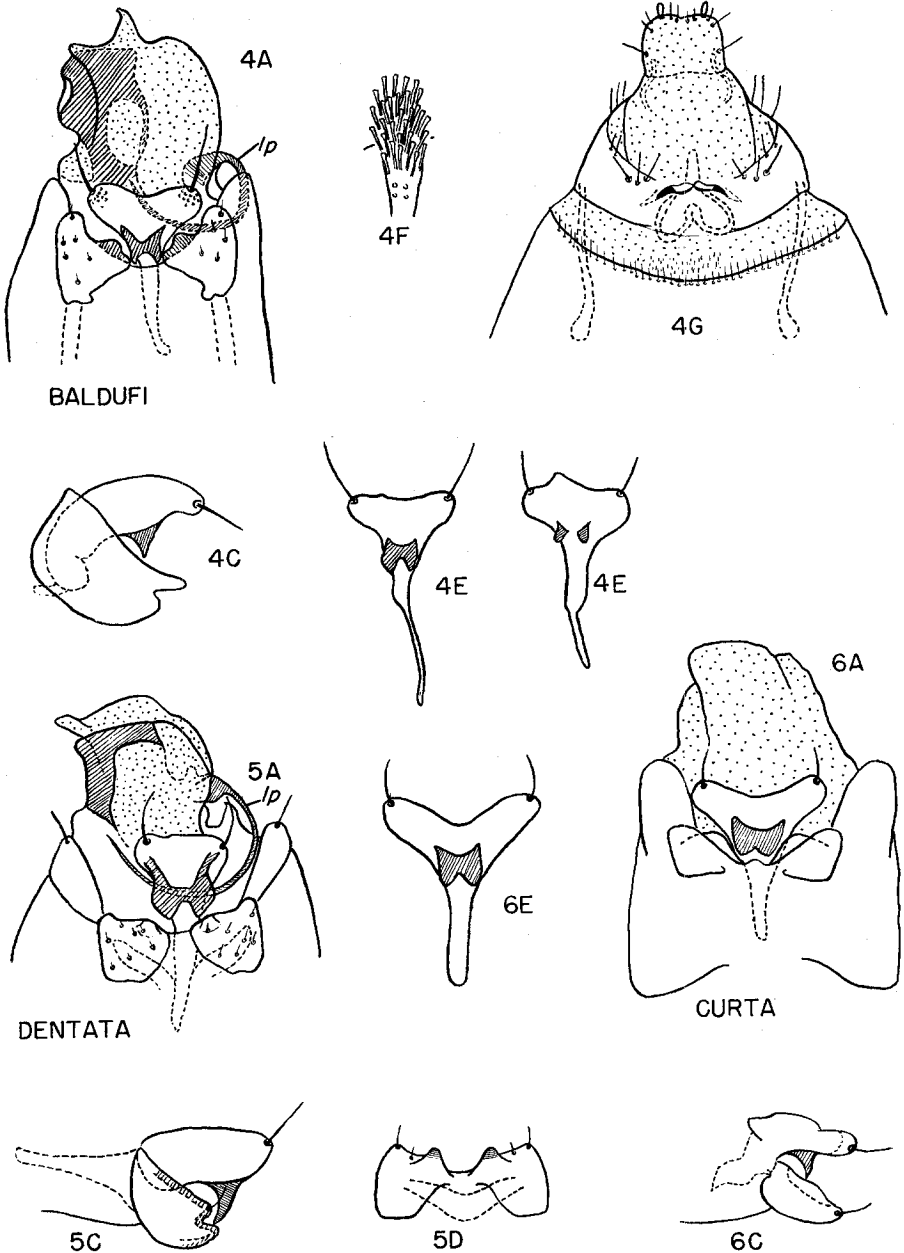
Orthotrichia americana is probably the most specialized of the six known Nearctic species. The female genitalia are figured by Ross (1944, p. 140, Fig. 501). The type locality is Washington, D. C. (Banks, 1904). New records.—INDIANA: Winona Lake, June 28 to Aug. 30, 1942, W. E. Ricker, Aug. 12, 1948, E. L. Mockford; Lake James, Steuben Co., Aug. 19, 1948, E. L. Mockford; LOUISIANA: Natchitoches Parish, Aug. 13, and Oct. 9, 1957, B. R. Buckley; MAINE: Salisbury Cove, 1955, H. & M. Frings; CONNECTICUT: Mt. Carmel, Aug. 11, 1944.

Orthotrichia instabilis DENNING

This species is most closely related to *baldufi* and *dentata* but can be distinguished from them by the minute ventral processes of the shaft, the angularly cleft posterior margin



Figs. 1-3.—Male genitalia of *Orthotrichia*. A, ventral aspect; B, lateral aspect; C, lateral aspect of claspers and subgenital plate; D, ventro-caudal aspect of claspers; H, lateral aspect of aedeagus. *ip*, internal process; *lp*, left process; *rp*, right process.



Figs. 4-6.—Genitalia of *Orthotrichia*. A-F, male genitalia. A, ventral aspect; B, lateral aspect; C, lateral aspect of claspers and subgenital plate; D, ventro-caudal aspect of claspers; E, ventral aspect of subgenital plate; F, ventral aspect of process of seventh sternite. G, female genitalia, ventral aspect. *lp*, left process.

of the subgenital plate, and the comparatively long, rounded claspers (Figs. 3A, 3D). Through the kindness of Dr. Denning, we were able to examine the holotype of this species. The type locality is Winter Park, Florida (Denning, 1948). New records. — NEW HAMPSHIRE: Lee, July 4 and 15, 1949, R. L. Blicke; Durham, Aug. 10-21, 1959, R. L. Blicke.

Orthotrichia cristata MORTON

The absence of ventral processes on the shaft of the subgenital plate and the prominent thumb-like swelling on the ventral margin of the claspers are distinguishing characteristics of this species. The claspers flare outward and are somewhat acuminate. In lateral view, the apex of the subgenital plate is curved downward more than in any other species. A sclerotized process *rp* with its roots in the membranous tenth tergite lies above and parallel to the aedeagus, but this does not appear to be homologous with the spirally twisted process in *americana*.

The female genitalia are figured by Ross (1944, p. 40, Fig. 502). The type locality is Lake Forest, Illinois (Morton, 1905). New records. — INDIANA: Winona Lake, July 8, and Aug. 30, 1942, W. E. Ricker; WISCONSIN: Minong, Pokegama L., June 26, 1957, F. R. Steggerda.

Orthotrichia baldufi NEW SPECIES

Male.—Length 2.5-3.0 mm. from frons to apex of wing. Wings uniform yellowish brown in alcohol, grayish brown when dry; eyes black. General structure typical for genus. Male genitalia as in Fig. 4A. Clasp-

ers small, mesal margin stepped, lateral margin evenly curved, apex bluntly rounded. Subgenital plate T-shaped, posterior margin shallowly emarginate or irregularly truncate (Figs. 4A, 4E), ventral processes variable in size. Tenth tergite membranous and somewhat cleft at apex, right lateral margin with an irregular, strongly sclerotized area, left lateral margin bearing a sickle-shaped spine curving inward.

Female genitalia simple (Fig. 4G), annulate at base, membranous at apex; bursa copulatrix bilobed.

Holotype male.—Eaglenest Lake, St. Louis Co., Minn. July 24, 1953, at light, W. V. Balduf, collector. Allotype female. — Same data as holotype. Paratypes. — 46 males, 7 females. Same data as holotype; 9 males same locality as holotype but July 16, 1957, at light, W. V. Balduf. Other localities. — NEW HAMPSHIRE: 1 male, Lee, July 7, 1954. FLORIDA: 1 male, Chat-tahoochee, June 19, 1957. Both of the latter specimens were collected by R. L. Blicke.

This species is most closely related to *dentata* and *instabilis*, differing principally in the shape of the claspers and the degree of sclerotization of the right margin of the tenth tergite. The lateral lobes of the claspers are not as long as in *instabilis* but are longer than in *dentata*. The posterior margin of the subgenital plate varies somewhat (Fig. 4E).

The female differs from *americana* and *cristata* in the extent of sclerotization of the ring-like eighth segment and in the shape of the small ventral processes on this segment (*conf.* Ross 1944, p. 140).

Orthotrichia curta NEW SPECIES

Male.—Length 2.0-2.5 mm. from frons to apex of wing. Wings yellowish brown in alcohol, grayish brown when dry, eyes black. General structure typical for genus. Male genitalia as in Fig. 6A. Claspers short and broad, mesal margin stepped, lateral margin nearly straight, outer lobe narrowed and bluntly rounded. Subgenital plate Y-shaped, posterior margin emarginate (Figs. 6A, 6E), ventral processes rather large. Tenth tergite entirely membranous, amorphous.

Female unknown.

Holotype male.—Temple Terrace, Florida, June 13, 1958, R. L. Blickle. Paratypes.—14 males, same data as holotype; 19 males, Goose Prairie, Florida, April 22 to May 6, 1958; 7 males Highland Hammock, Florida, April 22 to June 13, 1958. All specimens were collected by R. L. Blickle.

Orthotrichia dentata NEW SPECIES

Male.—Length 3.0-3.5 mm. from frons to apex of wing. Color as in *baldufi*. General structure typical for genus. Male genitalia as in Fig. 5A. Claspers small, subquadrate, postero-ventral margin with a darker mesal swelling as long as lateral lobe (Fig. 5D); lateral margin slightly rounded. Subgenital plate

subtriangular, posterior margin truncate, ventral processes large, incisor-like. Tenth tergite membranous, right margin with an L-shaped, darkly sclerotized area, left margin bearing a sickle-shaped spine curving inward as in *baldufi* and *instabilis*.

Female unknown.

Holotype male.—Temple Terrace, Florida, April 1, 1958, R. L. Blickle. Paratypes.—8 males, same data as holotype; 1 male, same locality as holotype but April 23, 1957. All specimens collected by R. L. Blickle.

The mesal lobe of the clasper is similar to that of *cristata* but the lateral lobe is shorter and less conspicuous. The sclerotized area and the sickle-shaped spine of the tenth tergite places this species close to *instabilis* and *baldufi* but the claspers are of a different shape as explained in the key.

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